greater part of his works, always seeking in physiology pathological deductions for the use of practitioners.

As regards pure physiology, he studied the acid of the gastric juice, trying to show that it never existed uncombined (1874–77), the rhythmical function of the heart and its development in the embryo (1876), and more especially the function of the central nervous system, and of the bulb in particular (1877–1880). In this way he showed the existence of two bulbar centres, one acting upon breathing (it was the centre of Le Gallois and Flourens), the other upon the cardiac muscle, which clearly explained the two possible causes of death, either a stop of the respiratory movements with persistence of the beating of the heart or *vice versâ*. He showed also the functional association of the eyes in the binocular vision, owing to the narrow connections between their motor nerves. As regards the physiology of the nerves, again, he revealed the existence of the tractus of crossed hemianæsthesy, published a few notes on the excitability of the nervous centres, the reflex movements, the functions of the semicircular canals (1881), and, lastly, a refutation of the theory which made the cerebellum the seat of muscular strength.

Not less numerous are the works that he published upon experimental and comparative pathology.

But his special study was experimental physiology applied to therapeutics and toxicology; he published works on the properties of many substances, such as the narceine (1866), which he considered as the best sedative of the nervous system; the bromides, the soothing influence of which he investigated (1867–1869); the eserine or alkaloid of the Calabar bean (1869); propylamine (1873); aconitine, the advantages of which he showed as a sedative of sensibility (1875); colchicine, sparteine, boldo, salts of strontium, &c.; lastly, in 1877, he published a study on the alkaloids of cinchona, which he named in the following order, according to their poisonous qualities: Cinchonine, cinchonidine, quinidine. In fact, he made a special study of poisons in general, animal as well as mineral, natural as well as artificial.

In concluding this cursory view of Laborde's works, we cannot do better than mention his ingenious method of the rhythmical tractions of the tongue, which was sufficient to make the name of its inventor known throughout all the world. There is no need to expatiate on this most simple and efficient process of setting the respiratory reflex to work. It is known and used everywhere, and it has called back to life numbers of apparently drowned or suffocated people.

In fact, Laborde was not only a savant, but a great philanthropist, and this quality, together with his profound knowledge of toxicology, brought him to the front as one of the best qualified in the controversy raised recently on the question of alcoholism.

For this reason, Laborde, who had been a member of the Académie de Médecine since 1887, was trusted by this learned body with the report on the essences to be forbidden as noxious, which the Government had required from them. In this work he exhausted what strength was left to him. He strenuously defended every one of his arguments against the objections of his colleagues, and at last succeeded in making them adopt every item of his report. But the work proved too much for him, and he died on April 5. He was vice-president of the Society of Biology, director of the Laboratory of Anthropology at the École des Hautes Études since 1893, and professor at the School of Anthropology. He was besides one of the oldest and ablest scientific journalists. He started *La Tribune Médicale,* a periodical open to all young medical men, which he edited to the last.

He was one of the few French savants who did not belong to the Legion of Honour. Of course, the decoration was several times offered to him, but he thought it a distinction which should be exclusively military, and he never allowed his actions to contradict his opinions.

J. DENIKER.

NOTES.

A MEETING of the council of the International Association of Academies is being held this week at the rooms of the Royal Society, that society being the directing academy of the association for the three years' period ending with 1904. The meeting will be attended by delegates from nearly all the principal learned academies of Europe, and will discuss several matters of importance to international science and philosophy, preparatory to the meeting of the general assembly which is to be held in London next year. Representatives of both sections of the association, the natural science section, and the history and philosophy section, will attend the council. In connection with the meeting of the council there will be on Friday a meeting of a special committee appointed to deal with a proposal for the establishment of an international organisation for the investigation of the anatomy of the brain. The foreign delegates were to be received by the president and fellows of the Royal Society at Burlington House on Wednesday evening as we went to press.

THE reply given by Mr. Balfour in the House of Commons on May 26, in answer to a question as to what the Government proposed to do to ensure the safety of the National Antarctic Expedition, was a rebuke which should not be received in silence by the joint Antarctic Committee. Mr. Balfour said:—" The Government are prepared to contribute to the relief of the officers and men on board the *Discovery*, which is now ice-bound in the Antarctic seas. The course taken by the two learned societies responsible for the expedition in respect to the contribution of money and men made by the Government is greatly to be regretted. I have always leaned towards the principle of extending the very limited aid which the British Government have been accustomed to give towards the furtherance of purely scientific research; but such action can only be justified so long as the Government are able to feel absolute confidence that the scientific bodies approaching them have placed before them all the information in their possession as to the estimated cost of their proposed action, and the limits within which they intend to confine it. That confidence has been rudely shaken by the present case." This statement has naturally received much attention, and the Antarctic Committee cannot permit the charges it contains to pass without reply. The two learned societies referred to are the Royal Society and the Royal Geographical Society, and the management of the expedition is in the hands of a joint committee of these bodies. From the beginning, however, the Royal Geographical Society has exerted a preponderant influence in the organisation of the expedition, and the Royal Society has yielded to it against the advice of its own representatives. When vital matters connected with the conduct of the expedition were in dispute in 1901, we on several occasions criticised the methods adopted, and regretted that the Royal Society had not taken a firmer position. Because the council of the Royal Geographical Society would not accept the recommendations of the joint committee, the Royal Society allowed itself to be overruled, though Sir Archibald Geikie, Prof. E. B. Poulton and Mr. J. Y. Buchanan objected to the surrender. The whole story was told in a letter sent by Prof. Poulton to fellows of the Royal Society, and published in NATURE of May 23,

1901. This protest was, however, disregarded, with the result that the Society now finds itself held responsible for management which has really been left to the geographers. The *Daily Mail* has published several articles in which the joint committee is severely handled, and the facts disclosed as to the estimated and actual costs of the expedition are, to say the least, such as will not encourage the public to believe in the foresight and business capacity of men of science.

THE condition of the German Antarctic Expedition which, under the command of Dr. von Drygalski, left Germany in August, 1901, is causing great anxiety, and hurried preparations are being made for the dispatch of a relief expedition this summer. It will be remembered, a correspondent of the *Pall Mall* remarks, that a station was erected on Kerguelen Island in January, 1902, which was intended to serve as a place of observation and as a base for the expedition ship *Gauss*, which was to penetrate much farther south. Those who were at the station, however, suffered terribly from the climate, and then were attacked by beri-beri, which appears to be endemic in that part of the world. This malady carried off the greater number of those who were afflicted with it, among them being Dr. Enzensperger, the meteorologist. The *Gauss* sailed south, but as nothing has been heard of her for a long time it is feared that she is lost, and doubts have been expressed that any of her present officers and crew will ever be heard of again. An attempt is, however, to be made to find them. The matter was discussed in the Reichstag a few days ago, and about 25,000*l.* was unanimously voted for a relief expedition. Preparations for departure will not be begun until the middle of next month—the latest time, according to scientific opinion, that the *Gauss* could by any chance make her way out of the vast fields of ice over which the terrible severity of an Antarctic winter is now spreading.

THE fifth International Congress for Applied Chemistry is being held in the Imperial Diet Building at Berlin, under the presidency of Prof. Dr. Otto N. Witt. About 2200 members, accompanied by more than 300 ladies, are attending the Congress, at which the European States and several other States are represented by official delegates. The chief British societies, that is, in addition to the Chemical Society, the Institute of Chemistry, the Society of Chemical Industry, the Society of Public Analysts, the Federated Institute of Brewing, the Royal Societies of London and Edinburgh, the Iron and Steel Institute, the Royal Institution, the British Association and other bodies, nominated delegates for the organising committee. The Congress will deliberate in eleven sections and three subsections. The German Electrochemical Society, which last year adopted the name of German Bunsen Society for Applied Physical Chemistry, will also hold its annual meeting at Berlin during this week, and will take charge of the tenth electrochemical section. This section, however, will meet in the Physical Institute of the University of Berlin. The congress offices, so far at 31 March Str., Charlottenburg, will be removed to the Imperial Diet Building (Reichstags-Gebaüde) on June 2, and a post office has been opened in this building for the convenience of members. There are 350 papers and reports to be read. The great electrical works of Berlin and some other works will be thrown open to members, but no chemical works apparently. The city of Berlin will entertain the Congress, and an excursion to the Havel Lakes has been arranged for Sunday, June 7.

THE proceedings of the International Telegraph Conference, at which nearly fifty different States are represented, commenced last week, and will continue day by day during this month. The proceedings are private. Mr. J. C. Lamb, the principal delegate of Great Britain, has been elected president of the conference, and Messrs. J. Ardron and P. Benton vice-presidents. This is the ninth conference which has been held; at the last the cable companies have been represented as well as the various States. In addition to the business of the conference, dinners and other entertainments have been arranged in connection with it; a dinner was given last week by the Submarine Telegraph Companies at the Hotel Cecil, Sir J. Wolfe-Barry presiding, and nearly 500 guests being present. The president of the Institution of Electrical Engineers entertains the delegates and the Institution at a concert at the Albert Hall on June 11, and the conversazione of the Institution will also be held during the sitting of the conference.

MR. MARCONI is reported to have said on his return to England last week that it will be another six weeks before Transatlantic communication will be resumed. The precise nature of the breakdown has not been published. The American company proposes to extend greatly the system in America by establishing new stations in New York and on the great lakes. It is also stated that the report that Mr. Marconi was suffering from nervous breakdown and would have to take a prolonged rest is unfounded.

THE council of the Institution of Electrical Engineers has received and accepted an invitation from the American Institute of Electrical Engineers to visit the United States in 1904. The McGill University, of Montreal, has invited the two Institutions to hold a joint meeting in their building at this time. The invitations, both from the American Institute and the McGill University, are couched in the most cordial terms, and the council hopes that it may be possible to arrange not only for a visit to the eastern States of America and to the St. Louis Exhibition, but also for the proposed joint meeting in Canada.

THE report of the council of the Institution of Electrical Engineers, adopted at the annual general meeting held on May 28, is a record of real scientific activity and progress. The Institution is exerting the best of influences upon electrical science, and its work and scope are rapidly extending. Mr. Robert Kaye Gray has been elected president in succession to Mr. Swinburne. A new local section has been formed with its centre at Leeds, embracing the whole of Yorkshire with the exception of Middlesbrough and the Cleveland district, which were already included in the area of the Newcastle local section. The council has awarded the following premiums for papers and communications:—the Institution premium, value 25*l.*, to Dr. J. A. Fleming, F.R.S., for "Photometry of Electric Lamps"; the Paris Electrical Exhibition premium, value 10*l.*, to Mr. M. B. Field, for "A Study of the Phenomenon of Resonance in Electric Circuits by the Aid of Oscillograms"; two extra premiums, value 10*l.* each, one to Messrs. A. D. Constable and E. Fawssett jointly, for "Distribution Losses in Electric Supply Systems"; and the other to Dr. W. M. Thornton, for "Experiments on Synchronous Converters"; an original communication premium, value 10*l.*, to Messrs. A. Russell and C. C. Paterson, for "Sparking in Switches." Students' premiums have been awarded to Messrs. J. Griffin, F. J. Hiss, E. Fisher, A. G. Ellis, and T. H. Vigor. Salomons scholarships, value 50*l.* each, have been awarded to Mr. G. B. Dyke, of University College, London, and to Mr. H. W. Kefford, of the Central Technical College. The award of the David Hughes scholarship, value 50*l.*, has been made to Mr. W. H. Wilson, of King's College, London.

It has been decided to christen the new society of electrochemists "The Faraday Society," the object of the Society, as stated in a subtitle, being to promote the study of electrochemistry, electrometallurgy, chemical physics, metallography, and kindred subjects. It is proposed to start work at once by beginning a half-session on July 1, the first ordinary meeting being fixed for June 30; the papers to be read will be announced in due course. Arrangements have been made to publish the proceedings in the *Electrochemist and Metallurgist*, which will be issued free to members; the papers will be circulated before being read, a plan which it is hoped will improve the discussion upon them. It is also hoped that it will be possible to supply members with the *Transactions* of the American Electrochemical Society, either free or at a very small cost. The first president is Mr. J. W. Swan, F.R.S., and the vice-presidents are Prof. Crum Brown, Lord Kelvin, Sir O. Lodge, Dr. Ludwig Mond, Lord Rayleigh, Mr. A. Siemens and Mr. J. Swinburne. A set of rules has been drawn up by the council; these and any other particulars can be obtained from the secretary, Mr. F. S. Spiers, 82 Victoria Street, S.W. We wish the Society all success.

We regret to have to announce that Dr. A. A. Common, of Ealing, died very suddenly on Wednesday morning last.

Sir William Ramsay, K.C.B., F.R.S., has been elected a corresponding member of the Academy of Sciences of Vienna.

The presentation of the Hofmann medals to M. Henri Moissan and Sir William Ramsay is to take place at the Hofmann-Haus, Berlin, to-day, June 4.

The annual conversazione of the Society of Arts will take place at the Royal Botanic Gardens, Regent's Park, on Tuesday, June 30.

It is expected, says *Science*, that the International Electrical Congress will be held at St. Louis, during the week beginning September 12, 1904. It will immediately precede the International Congress of Arts and Sciences.

At the anniversary meeting of the Linnean Society on May 25, Prof. S. H. Vines, F.R.S., was elected president for the ensuing year. The Linnean medal was presented to Dr. M. C. Cooke.

According to a Reuter message from Paris on May 30, a telegram from Fort de France, dated May 28, states that the volcano of Mont Pelée is again showing activity, and that the Council-General of Martinique is urging the evacuation of the whole of the north side of the island.

According to a Press despatch from Washington, dated May 13, the executive committee of the Carnegie Institution reports that the entire sum of 40,000*l.* allotted to grants for original research has been distributed, and that of the 8000*l.* set aside for publications to be made this year, 4000*l.* has been assigned to special publications. No more grants for researches will be made until after the next meeting of the board of trustees, which will be held in December.

A terrific tornado passed over the southern portion of Gainsville, Georgia, at noon on Monday, June 1, destroying several large buildings and killing sixty-four persons. The track of the tornado was about one hundred yards wide, and the damage done was confined to it. The storm came with great suddenness, and within a couple of minutes the two upper stories of a four-story brick-built factory were carried away to distances of hundreds of feet. During the tornado deep darkness prevailed, and the air was hot and oppressive. Five minutes later the sun was shining.

Extraordinary rains in parts of the United States have caused great damage and loss of life by floods in the Indian Territory, Oklahoma, Kansas, Missouri, Nebraska, and Iowa. At North Topeka, Kansas, seven thousand out of the ten thousand inhabitants left the city on May 30 to escape the deluge. One hundred and fifty persons are known to have been drowned. The rescued say that the whole of North Topeka was flooded on Friday faster than the people could get away. On May 30 the level of the Kansas River rose at the rate of three inches an hour. On June 1 the Missouri River was thirty feet above low-water mark at Kansas City, and was rising rapidly.

On Saturday afternoon, May 30, and following night London was visited by two violent thunderstorms. Storms of a destructive character, resulting in loss of life, also occurred over a great part of England, especially in the Thames Valley, and were apparently due to the passage of small cyclonic depressions moving slowly from south-east to north-west. Heavy downpours of rain accompanied or followed both storms, but its intensity varied considerably; about an inch and a half fell during the first storm in one of the southern suburbs of London, while at a distance of a very few miles, where the thunder and lightning appeared to be equally violent, the fall only amounted to a few tenths of an inch. The heat was oppressive; near London on Whit Monday the thermometer in the screen rose to 83°, and the weather was exceptionally brilliant in the south and east of England generally, but dull and cool in the north and west.

The *Times* states that the master of the trawler *City of Lincoln*, which arrived at Kirkwall on June 1 from Iceland, reported that on the night of May 27, off the south-east coast of Iceland, a volcanic eruption was observed a considerable distance to the eastward, probably at Mount Hekla. Dust fell on the deck of the trawler, and the sea was discoloured to a distance of about thirty miles from the island.

A Reuter message from Constantinople on May 26 states that belated reports have been received of the earthquake at Van on April 29, by which the town of Melazgerd was totally destroyed, with its entire population, numbering about 2000 persons. More than 400 houses in neighbouring villages collapsed. A somewhat severe shock of earthquake was felt in Constantinople on the morning of May 26, but no damage was done. Further particulars of the earthquake at Van are contained in a despatch from His Majesty's Consul at Erzerum. The villages of Patnotz, Hadjili, Mollah Ibrahim, Zoussicko and Molla Mustapha were completely destroyed with the exception of the mosque, school and two houses. Seventeen other villages have been partially destroyed. In Sipoki the villages of Mollah Hassan, Berdav, Mirzeh, Kara Khelil Alia have been completely destroyed, and eight other villages partially destroyed. It would appear that the centre of the seismic disturbance was in the neighbourhood of Mount Sipan, and the area of its greatest violence extended along the valley of the Eastern Euphrates, covering the Kazas of Boulanyk and Melazgerd, and the Patnotz district.

As already announced, the autumn meeting of the Iron and Steel Institute will be held at Barrow-in-Furness on September 1–4, under the presidency of Mr. Andrew Carnegie. The programme will embrace visits to works, docks, and iron ore mines, and excursions will be arranged to the Lake District and to Blackpool. A detailed programme will be issued when the local arrangements are further advanced. This programme will contain a list of the papers that are expected to be read.

THE twenty-first congress of the Sanitary Institute will be held at Bradford on July 6–11. The inaugural address to the congress will be delivered by the president, the Right Hon. the Earl Stamford. Numerous sectional meetings will be held, the sections with their presidents being as follows:—(1) Sanitary science and preventive medicine, Prof. T. Clifford Allbutt, F.R.S.; (2) engineering and architecture, Mr. Maurice Fitzmaurice, C.M.G.; (3) physics, chemistry and biology, Prof. C. Hunter Stewart. On July 8 there will be conferences of those engaged in the various branches of practical sanitary science, and in the evening a conversazione and reception by the Mayor of Bradford. The concluding day will be devoted to excursions.

THE Physical Society has for several years held its meetings at Burlington House, but the fellows have been given notice that a change is contemplated. It is proposed to hold meetings on the second and fourth Fridays of the month alternately in the afternoon and the evening at the Royal College of Science, South Kensington. The council trusts that convenience and equipment available when the Society meets in a physical laboratory will encourage fellows to illustrate their papers by experiments, and thus add to the interest of the meetings. The council has also under consideration the formation of a student class in the Society. This matter will shortly be brought forward at a special general meeting.

MR. R. S. EARP writes from Buckfastleigh, South Devon, to say that on comparing the results of Prof. Thorpe's analysis of the dust of "red rain" (p. 53) with his own, the chief dissimilarity was found in the amount of organic matter. This may be explained by the fact of Prof. Thorpe's analysis being of the sediment only of the rain, whereas Mr. Earp's was of the rain itself, or rather of the solid constituents of the rain. The rain collected did not clear itself even on long standing, the supernatant liquid being emulsion-like in appearance. Mr. Earp concludes "that the greater portion of the organic matter would exist suspended in the fallen rain, and so would not appear in the result of Prof. Thorpe's analysis."

THE scientific balloon ascents on April 2 were participated in by France, Germany, Austria, Russia, and Blue Hill, U.S., and were made by means of manned and registering balloons, and kites. At Trappes the registering balloon burst at 8550 metres; minimum temperature $-47^{\circ}\cdot0$ C. (at starting $6^{\circ}\cdot8$). At Itteville (Paris) the ascent was made in the evening; temperature $-54^{\circ}\cdot0$ at 9560 metres (at starting $8^{\circ}\cdot0$); an altitude of 12,760 metres was reached. At Strassburg a height of 10,000 metres was attained; minimum temperature $-44^{\circ}\cdot4$, at starting (5h. a.m.) $5^{\circ}\cdot7$. At Berlin one of the several balloons dispatched reached 10,400 metres; at 8380 metres the temperature was $-42^{\circ}\cdot0$ (at starting $2^{\circ}\cdot0$), while another, started two hours earlier (4h. 57m. a.m.), recorded $-47^{\circ}\cdot8$ at 8670 metres. At Blue Hill a kite reached 3067 metres, temperature $-6^{\circ}\cdot2$; at the same time the temperature at the observatory was $8^{\circ}\cdot1$ (height 159 metres). Atmospheric pressure was fairly uniform over Europe on the day of the ascents, and the type of weather was generally cyclonic in character.

IN a paper read before the R. Accademia delle Scienze dell' Istituto di Bologna on January 11, Prof. A. Righi describes experiments on the ionisation of air by an electrified point. Some striking results depending on the motion of the ions along the electric lines of force were obtained. A sheet of ebonite backed by a metal plate was fixed in front of a point discharge, and between them was placed a wire gauze screen, which closed an aperture in a metal case surrounding the discharge. A spark from a Leyden jar to the metal plate produced for a short time a powerful electric field traversing the ebonite plate and the air space between it and the gauze. A well-defined image of the wire gauze was then developed upon the ebonite by treating it with a mixture of powdered sulphur and red lead, which made visible the portions of the ebonite to which the ions had imparted a charge. The "electric shadow" of the wire remains free from charge.

A NEW form of stereoscope for X-ray work is described by M. T. Guilloz in a recent number of the *Journal de Physique*. A single X-ray tube is used, being so mounted that it can be rapidly oscillated between two positions. A cam rotating at a speed of about 300 revolutions per minute is used to oscillate the tube; this cam is cut so that the time taken in moving from one position of rest to the other is about 1/10th of the time of rotation. Two radiographic images of the object under examination are thus formed on the screen which are displaced by an amount varying as the amplitude of oscillation of the tube and its distance from the screen. Two shutters, controlled electromagnetically by the oscillating apparatus, allow the right eye to view one image and the left the other, vision being entirely cut off during the time the tube is changing its position. There results, naturally, from the combination of these images an apparently solid reproduction of the object. It is claimed that the method is superior to those employing two tubes, or a tube with two anti-kathodes, as in these cases it is always difficult to obtain equal effects from both tubes or anti-kathodes. It is also stated that the tubes used by the author were not injuriously affected by the vibration.

THE Canadian Department of the Interior has issued a clearly printed map of Manitoba on the scale of an inch to 12½ miles. It will be useful to those desirous of taking up land in the country.

PARTICULARS of the mode of occurrence and removal of a carcase of the mammoth which had been discovered in 1901 in the province of Iakousk, in Siberia, are contributed with illustrations by M. L. Elbée (*La Nature*, May 23). The remains were half embedded in the snow and ice, and there were still preserved the eyes, the mouth, and even the stomach. Measurements showed that the animal was about 3 metres in length and 2 metres in height, and must have weighed about 1000 kg. The specimen has not yet been exhibited in public owing to the great difficulties experienced in preserving the skin.

IN the annual report for 1902 of the State Geologist of New Jersey, Mr. H. B. Kümmel, there is an account of the copper deposits of the State, by Mr. W. H. Weed. Copper minerals occur at many localities in the crystalline rocks and in the Triassic Red Sandstones, but only in the Red Sandstones are they of economic value. In these rocks the ores are almost always associated with basalt, dolerite, and diabase of very uniform chemical composition, and from these basic igneous rocks, in the opinion of Mr. Weed, the copper ores have been derived.

IN the account of the embryogeny of Zamia which Profs. Coulter and Chamberlain present in the *Botanical Gazette*, they show that during this stage of development the features of Zamia are intermediate between those presented by Cycas and the Conifers.

IN the Philippine Islands Government laboratories were organised by the United States authorities in 1901, and Dr. R. P. Strong was appointed director. The first annual report gives evidence of much work carried out under unfavourable conditions in temporary laboratories. The work of the biological department is mainly pathological, and is concerned with the study of Asiatic cholera and other tropical diseases. New laboratory buildings are announced, in which special facilities will be offered to foreign men of science who wish to undertake research work.

THE Californian red wood, *Sequoia sempervireus*, forms the subject of a *Bulletin* issued by the U.S. Department of Agriculture. Natural reproduction by seedlings is rare, as these require plenty of light, but the writer, Mr. Fisher, shows that effective second-growth is produced by sucker shoots. A brown rot disease affecting the standing tree is described by Prof. von Schrenck, but the cause of the disease which is said to arise in the heart wood has not been determined. Another *Bulletin,* by Mr. Foley, affords good proof of the value of careful lumbering as adopted on the Sewanee University Estate, Tennessee.

IN addition to some half-dozen short excursions to places of interest of easy access, and one long excursion to the north Donegal coast, beginning on July 10, which it has arranged, the Belfast Naturalists' Field Club is offering for competition during the session ending March 31, 1904, nineteen prizes, generally of the value of one pound, and in other cases of ten shillings, for collections of different botanical, geological and zoological objects. The prizes are to be in books or suitable scientific objects. Among the collections asked for may be mentioned the best herbarium of local flowering plants, representing not less than 150 species, with notes on variations adapting the plants to special environments; the algæ of Larne Lough, with an account of distribution; the algæ of Belfast Lough; fossils from the Rhætic and Lias of Ulster; and the best set of twelve photographs illustrative of any one branch of Irish archæology. A prize is also offered for the best original account of the habits of any marine annelid.

AN interesting interim report upon Cape horse-sickness has been published by Dr. Watkins Pitchford, the Government bacteriologist of Natal. In some respects this disease resembles human malaria, for it especially attacks horses kept on low-lying marshy ground, and those animals left to graze all night. In affected districts horses may be moved during the day without contracting the disease. Dr. Pitchford now suggests that a mosquito, probably of the genus Anopheles, is responsible for the conveyance of the infection. He has stalled horses by night in stables protected by wire gauze, or by a smoky atmosphere, in an infected district, with the result that they all remained perfectly well, whereas horses kept around and similarly treated, with the exception of the protection afforded by the wire gauze or smoke, succumbed. He therefore believes that it is established that horses protected from the attacks of winged insects enjoy immunity from horse-sickness.

THE January issue of the *Proceedings* of the Philadelphia Academy contains a list of the polycistid gregarines of the United States, by Mr. H. Crawley, and an account of the habits of spiders, by Dr. T. H. Montgomery.

WE have received three parts (Nos. 10–12) of Manchester Museum *Notes*, in two of which Prof. W. B. Dawkins deals with the older rocks of the Isle of Man, while in the third he describes certain iron implements found in the old "camp" in Bigbury Wood, near Canterbury. These implements prove that the camp belonged to the prehistoric period, and from this it is inferred that the well-known "Pilgrims' Way," which traverses such a large extent of country in the south of England, likewise dates from that epoch.

THE greater portion of the May number of the *Quarterly Journal of Microscopical Science* is occupied by an important paper from the pen of Mr. H. J. Hansen, of Copenhagen, on the genera and species of the myriopod order Symphyla. The first known species was described 138 years ago, and the order is now known to contain at least 100 species. The other contents of this part include an account of the body-cavity and nephridia of the Actinotrocha larva, by Mr. E. S. Goodrich; a description of various acorn-worms (Enteropneusta) from Madras, by Mr. R. K. Menon; and a notice of the radiolarian *Planktonetta atlantica*, by Dr. G. H. Fowler. The latter organism is distinguished from all other members of its group by the possession of a float, a diaphragm, and a single bundle of tubes of communication.

THE *Times* of May 19 contains a notice of the results of the survey of the fishes of the Nile, undertaken by the Egyptian Government, in cooperation with the trustees of the British Museum, which has just been brought to a conclusion, after three and a half years' hard work by Mr. W. S. Loat, who has had charge of the operations. The scheme was due to the initiation of the late Dr. John Anderson, and although, so far as the discovery of new species is concerned, its results have been disappointing, it has yielded important information with regard to distribution. Previous to the survey, the number of species of fish known to inhabit the Nile was about 90; it is now more than 100, Mr. G. A. Boulenger having described 14 new species from among a collection of between 9000 and 10,000 specimens. Mr. Loat carried his survey far up both the Blue and the White Niles, and thus completed the work begun in the early "sixties" by Consul Petherick. It is satisfactory to learn that Mrs. Anderson has made arrangements for the publication of a volume on the fishes of Egypt in the same style as those on the mammals and reptiles.

A USEFUL manual for practical photographers, by Mr. Alfred Watkins, entitled "The Watkins Manual of Exposure and Development," has reached a second edition. The text-book is published by the Watkins Meter Company, of Hereford, and contains much information likely to prove of service to photographers who already have some acquaintance with the subject, as well as to beginners.

THE fourth edition of the "Official Guide" to the Belfast and Northern Counties Railway, which has reached us, will provide the visitor to the north of Ireland with just the information he will want. The guide is liberally supplied with maps and illustrations, and there are notes on places and objects of scientific interest. The book is published by Messrs. R. Carswell and Son, of Belfast, and costs sixpence.

A NUMBER of attempts have been made at various times to introduce standard points on the temperature scale other than the freezing point and boiling point of water, and for high temperature work, especially the standardisation of platinum resistance thermometers, Messrs. Heycock and Neville have recommended the use, as a third standard temperature, of the boiling point of sulphur. The *Zeitschrift für physikalische Chemie* for April 23 contains an account of a very careful determination, by Messrs. T. W. Richards and R. C. Wells, of the position on the international hydrogen scale of a standard temperature intermediate between the freezing point and boiling point of water. As the mean result of twenty-two determinations made with four different thermometers, it was found that the transition temperature at which the monohydrate and the dekahydrate of sodium sulphate were both in equilibrium with an aqueous solution of the salt lay at 32·383° ± 0·001.

The water used was purified by distilling twice and freezing in a platinum vessel, and the sodium sulphate was crystallised until it gave a constant transition temperature.

THE additions to the Zoological Society's Gardens during the past week include a Serval (*Felis serval*) from South Africa, presented by Mr. C. H. Firmin; a Harlequin Elaps (*Elaps fulvius*) from Central America, presented by Captain J. B. Gilliat; a Greater Sulphur-crested Cockatoo (*Cacatua galerita*) from Australia, deposited; a Chinchilla (*Chinchilla lanigera*) from Chili, purchased; a Japanese Deer (*Cervus sika*), a Sambur Deer (*Cervus aristotelis*), a Red Deer (*Cervus elaphus*), a Thar (*Hemitragus jemlaicus*), an American Bison (*Bison americanus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

A REPORTED PROJECTION ON MARS.—A Reuter's correspondent at Cambridge, U.S.A., states that the Harvard College Observatory at Flagstaff reports the discovery of a large projection on Mars at 3.35 a.m. (G.M.T.) on May 26. The position angle of the projection is given as 200°.

REPORT OF THE OXFORD UNIVERSITY OBSERVATORY.—From the report of this observatory for the period May 1, 1902, to April 30, 1903, just issued by Prof. H. H. Turner, we learn that of the 1180 plates which had to be measured and reduced for the Astrographic Chart, 1100 are now completed, 170 of them having been finished during the period with which the report deals.

When these measurements are completed it is proposed to undertake the measures of the plates, obtained during the opposition of 1900–1901, of the planet Eros, for the purpose of obtaining a more trustworthy value for the solar parallax, this work having been undertaken as a supplementary labour by the International Astrographic Committee.

Paragraph vi. of the report gives an account of the fortuitous discovery of Nova Geminorum, which possibly would not have been discovered at Oxford but for the fact that the first batch of plates used in photographing the Nova's region for the Chart proved faulty, and thereby rendered it necessary that this zone should be rephotographed. It was whilst photographing the zone the second time that Mr. Bellamy used the Nova as a "setting" star, thereby causing the inquiry to be set on foot, when the plate came to be measured, which led to the happy discovery that the bright star he had used in setting his instrument was a hitherto unknown object.

PERIODICITIES OF THE TIDAL FORCES AND EARTHQUAKES.—In a paper communicated to No. 3, part ii., vol. lxxi. of the *Journal* of the Asiatic Society of Bengal, Mr. R. D. Oldham, of the Geological Survey of India, discusses the relations between the periodicity of the earthquake shocks recorded by a seismograph set up at Shillong, Assam, during the period August, 1897, to December, 1901, and the periodicity of the tidal forces obtaining at that place during the various relative positions of the sun and moon.

After deducing the reasons for expecting the shocks to appear at certain times during the day and night when the tidal force is at a maximum at the place of observation, Mr. Oldham sets out the recorded shocks in a series of tables and curves. On examining these it is clearly seen that there was a real and a very large variation in the diurnal distribution of shocks in Assam during 1897–1901, their greatest frequencies occurring at 10–11 p.m. and 6–7 a.m., and superimposed on this regular but unexplained variation there was a smaller one, which appears to have been due to the tidal stresses set up by the attraction of the sun. If this latter variation is really due to tidal stress, it then appears that the horizontal component of the stress is much more effective than the vertical component, whilst the effects are more dependent on the rate and range of the stress than on its amount.

Mr. Oldham points out that these results are purely provisional, dealing as they do with only a short period of observation in one particular locality, but urges that they are definite enough to warrant the obtaining of a longer record at a place, situated within or near the tropics, where earthquakes are of frequent occurrence.

MISHONGNOVI ANTELOPE-SNAKE CEREMONIES.[1]

IN each of five of the seven Hopi pueblos of Arizona are performed during each year from eight to twelve ceremonies of nine days' duration. The rites of the first eight days are secret, and have certain elements in common; all terminate on the ninth day in a public performance, which has many elements of a gorgeous pageant.

Of the summer ceremonies, those held by the Antelope and Snake societies, which cooperate, are the most spectacular and best known. They alternate in each village annually, with the ceremonies performed by the Drab- and Blue-Flute societies. Thus, in even years, the Snake and Antelope societies perform in Oraibi, Shumopovi and Shipaulovi, and all Flute societies in Mishongnovi and Oraibi; in odd years, the reverse is true.

The time of the Snake-Antelope ceremonies is determined by the date of the last day of the Niman ceremony, which occurs in July, and at which time the Katcinas and masked gods disappear until the following winter.

Four days from this time, certain priests of the Snake-Antelope societies meet in a room, make certain *bahos* or prayer sticks, which are deposited in a shrine on the following morning, at which time the village Crier announces from the house-top the date of the first day of the Snake-Antelope performance, four days hence.

At that time, the chief priests of the Snake-Antelope fraternities meet in their respective *kivas* or underground chambers. During the next four days, the Antelope priests gather in constantly increasing numbers in their *kivas*, make *bahos*, indulge in fraternal smoking, and on the fifth day, prepare on the floor of their *kiva* a sand picture and erect their altar.

During this time the Snake priests have been engaged in a ceremonial hunt for snakes, scouring the country to the north on the first day, on the west on the second, &c.

Very early on the sixth, seventh, eighth and ninth days the Antelope priests gather about their altar, and, reinforced by the chief priest of the Snake society and two personages representing the Snake Youth and Antelope Maiden of the legend, sing eight traditional songs. These performances are the most beautiful and sacred of the entire ceremony. On the eighth and ninth days of this singing ceremony there is the added element of two Snake men, dressed as Kalehtaka or Warriors, who perform with the bull-roarer and lightning-shooter, after which they, with an Antelope priest and fifty or sixty young men of the village, repair to a spot in a plain far below the mesa, where, after the deposition of *bahos* and the laying of cloud symbols by the Antelope priest, there begins a spirited and exciting race on the part of the young men to the summit of the mesa. The winner of the race on each morning receives from the hands of the chief of the Antelope priests a small netted gourd containing water from the medicine bowl, which has been fertilised by smoke, which he later deposits in his field.

On the afternoon of the eighth day occurs a public performance in the plaza, participated in by all the Antelope and Snake priests, properly costumed, at which time the Antelope men in turn carry in their mouths a corn-husk packet, receiving it from the *kisi* or booth of cottonwood especially erected in the plaza for this purpose.

On the ninth day occurs the most sacredly guarded event in the Snake *kiva*. At noon the snakes, numbering from sixty to eighty, one-third or one-fourth being rattlesnakes, which have been guarded in this *kiva* in earthenware jars, are placed in one large bag. The Snake priests gather along one side of the *kiva* in line, seated upon stones. In front of the chief priest is a bowl containing medicine water.

---

[1] "The Mishongnovi Ceremonies of the Snake and Antelope Fraternities." By George A. Dorsey and H. R. Voth. Field Columbian Museum Publication 66, Anthropological Series, vol. iii. No. 3.